

**TEACHING, LEARNING RESOURCES AND PUPILS' PERFORMANCE IN
MATHEMATICS IN SECONDARY SCHOOLS IN CHINATO DIVISION**

KURIA EAST DISTRICT KENYA

BY

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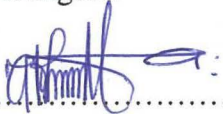
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**A RESEARCH REPORT SUBMITTED TO THE INSTITUTE OF OPEN AND
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DECLARATION

I **CHACHA MAROA JOHN** do hereby declare that, "Learning Resources and pupil's performance in mathematics in Secondary school of Kuria East District" as presented in this report is entirely my own original work, except where acknowledged and that it has not been submitted before to any other University or institution of higher learning for the award of a degree.

Signed..........

CHACHA MAROA JOHN

Date.....18/10/2010.....

APPROVAL

This research report has been submitted for examination with my approval as a University supervisor.

Signed.....

Mrs. Taligoola Deborah

Date. 21/8/10.....

DEDICATION

Special dedication goes to my dear wife Mary Nchagwa, children Meshack and Michele and the entire family for their patience, support and prayers they gave to me.

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TABLE OF CONTENTS

DECLARATION.....	i
APPROVAL	ii
Signed.....	ii
Date.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS	v
LIST OF ABBREVIATION.....	vii
ABSTRACT	viii
CHAPTER ONE.....	1
INTRODUCTION	1
1.0Introduction	1
1.1 Background of the Study.....	1
1.2 Problem Statement.....	3
1.3 Purpose of the Study.....	4
1.4 Objective of the study.....	4
1.5 Research Questions.....	4
1.6 Null Hypothesis	5
1.7 Significance of the Study.....	5
CHAPTER TWO.....	7
LITERATURE REVIEW	7
2.0 Introduction	7
2.1 Theoretical Framework.....	7
2.2 How Children Learn Mathematics	8
2.3 Factors That Affect Children Learning of Mathematics	10
2.4 The Available Learning Resources in School	12

2.5 The Effect of Learning Resources on Pupils Academic Performance in Mathematics	13
CHAPTER THREE	15
RESEARCH METHOPDOLOGY	15
3.0 Introduction	15
3.1 Research Design	15
3.2 Research Environment	15
3.3 Population and Sample	16
3.4 Research Instrument	16
3.5 Methods of Data Analysis	17
CHAPTER FOUR	18
DATA PRESENTATION, ANALYSIS AND INTERPRETATION	18
4.0 Introduction	18
4.1 Data Description	18
4.1.1 Description of Respondents According to Gender	18
4.1.2 Description of Pupils by Class Group Attended	19
4.1.3 Description of Marks by pre-test post test Groups	20
4.2 How Children Learn Mathematics	21
CHAPTER FIVE	28
SUMMARY, CONCLUSION AND RECOMMENDATION	28
5.0 Introduction	28
5.1 Summary of Major Findings	28
5.2 Conclusion	29
5.3 Recommendations	30
5.4 Areas for Further Research	31
REFERENCES	32
APPENDICES	33

LIST OF ABBREVIATION

ETR&D	EDUCATION TECHNOLOGY RESEARCH AND DEVELOPMENT
K.I.E	KENYA INSTITUTE OF EDUCATION
MOE	MINISTRY OF EDUCATION
ZPD	ZONE OF PROXIMAL DEVELOPMENT

ABSTRACT

This study set out to investigate the impact of learning resources on the academic performance of pupils in mathematics, in Secondary school, Kuria East district Kenya. The study followed an experimental research design, using both the pre-test and post test scores of the experimental and control groups. Random sampling was used to assign 27 pupils to the experimental group and 27 to the control class, making a total sample size of 54 pupils. But purposive sampling was also used to select 10 teachers especially those who teach mathematics. Three instruments were employed in data collection one was a test result mark list for both the control and experimental group and pre-tested post test scores. The second was a researcher made questionnaire and an interview, for mainly the teachers. The student's samples to test were the major technique used to test the null hypotheses of the study frequency tables and cross-tabulations were also used in the analysis. The study found out that students learn more when they are doing, which implied using learning resources (80% of teachers views). Also 70% of teachers showed that pupils learn more when they are seeing and listening. Other factors that teachers are pupils' attitude (90%), environment (90%) teacher factors (90%) home factors (90%), learner's motivation and readiness (80%). The findings also showed that learning resources have a positive input on pupils' performance in mathematics, but it's not statistically significant ($t = -0.812$ and $p = 0.274$ for the pre-test and post-test scores, and $t = -0.802$ and $p = 0.284$) for the experimental and control classes, post test results). The researcher concluded that teachers and pupils prefer to teach and learn touching and seeing learning resources, however learning resources alone cannot boost performance, unless they are supplemented by other factors like positive pupils attitude, good environment, good experienced teachers, motivation, pupils readiness, willingness and home background. The researcher recommended that the relevance, suitability and applicability of learning resources should be tested before they are applied, and that learning resources should be provided together with improvement in other factors like teacher experience / training, pupils' attitude environment, motivation and parents contributions where resources are adequately provided without considering those factors, they (learning resources) may not significantly boost pupils performance as expected.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter shows the general background to the study. It presents the problem statement, the purpose of the study, objectives of the study, research questions and hypothesis, scope and significance of the study.

1.1 Background of the Study

There has been a deteriorating academic performance in Mathematics in the region. When children join class one from pre-school they usually have some basics about numbers. It is from this stage where teachers in Secondary one start introducing new concepts to the learners as well as introducing new symbols used in mathematics at that level. Children in lower Secondary are in concrete operational stage, where child can reason logically about concrete events and classify objects into different sets. Therefore they require a lot of materials to manipulate as well as play with. Learning will take place in young children at this stage when they are interested, therefore they need to be involved in their learning, whereby most of their senses are involved. But this is not always the case with most schools as most materials are costly therefore most materials are missing and if they are available they are not convenient to the children learning. Also teachers have not bothered to improvise, locally available materials. This has greatly affected the foundation of mathematics right from lower classes. The problem has been passed from one class to another such that there has been no solution to the problem yet.

The worst of it is that some teachers are permanently teaching lower classes such that they mess up and promote half baked children to the next class where another teacher is given a burden by his or her colleague, he or she will do the same thing eventually by the end of the year he or she promotes them to the next class with the same problem. When they reach class four now every teacher teaching class four will start complaining about the class. Here is where the problem is seen because different teachers teaches different subject, as opposed to lower Secondary where one teacher is in charge of the class teaches every subject. Due to this experiences in class four especially in Mathematics have instigated the researcher to carry out this study, at Secondary school. The trend has been persisting year in year out such that it affects the whole course and finally the performance is not pleasing. Due to this teachers teaching class eight are faced rough time preparing the candidates for the same. This means they have to drill their candidates for examination due to poor foundation they do not achieve much as expected. Therefore there are some sensitive issues which need immediate attention for the success of mathematics, Children should be handled well according to their level and capacity of understanding things. For example in lower Secondary classes learners need adequate learning materials which should be appropriately used. Children learn better by doing, they also learn through play, this make their learning real and interesting other than teaching the abstract materials which end up confusing learners.

The issue of method used in delivering message is also traditional, where teaching is teacher centered, where learners end up being passive listeners. This is common with most teachers in lower who think and believe to be the fountain of knowledge. Therefore

learners are not interested in listening to one person. This does not encourage thinking in learners as well as pupils to pupils' relationship, and teacher, pupils relationship. However good teacher pupil relationship as well as good pupil-pupil relationship can be easily fostered in lower Secondary as lower the teacher teaches all the subjects in his/her class, hence children are used to their teacher. Therefore individual differences are also easily realized but this is not always the case with most school. Sometimes there is low syllabus coverage in most classes, where the problem keeps on recurring from one class to the other finally performance of the subject.

1.2 Problem Statement

This study investigated the effect of learning resources and pupils performance in mathematics in Secondary school, Kuria East District, Kenya. Due to low academic performance in Mathematics in the region, the researcher decided to carryout this study. The problem has been recurring for sometime now, such that the community and other stakeholders have raised an alarm over the issue which was initially seen to be a passing cloud but now it is not improving, instead it has become a pain in the neck, to all stakeholders. Due to this problem people have had no sleep over the issue. They have tried hard to get the solution to the problem. This problem is a very big one such that may hinder the achievement of the millennium goals of 2030. Therefore the problem needs special attention for the future generation as well as the country as a whole. Because the problem does not affect one person only but the whole country and it is a high time for the government to chip in and address this problem so as to sustain the nation at this

critical moment. Where the nation is focusing ahead to be an industrialized country by 2030. This problem should be treated with the importance it deserves.

1.3 Purpose of the Study

The purpose of this study is to investigate the effect of learning resources on pupils' academic performance in mathematics in Secondary School, Kuria East District, Kenya. There has been low performance in mathematics as compared to other subjects in the region. It is this low performance in mathematics which has instigated the researcher to carry out this study. The researcher wanted to know the contribution of learning resources in the learning of mathematics, what are the available learning resources in the schools. There is no significant relationship between learning resources and pupils academic performance in mathematics.

1.4 Objective of the study

This study wanted to determine:

1. How children learn mathematics.
2. The factors that affect children's learning of mathematics.
3. The available learning resources in schools.
4. The effect of learning resources on pupil's academic performance in mathematics.

1.5 Research Questions

1. How do children learn mathematics?
2. What factors affect children's learning of mathematics?

3. What are the available learning resources in the schools?

4. What is the effect of learning resources on the academic performance of pupils in mathematics?

1.6 Null Hypothesis

HO: There is no significant relationship between learning resources and pupils academic performance in mathematics.

1.7 Significance of the Study

The findings of the study can help the children in learning, institutions to learn better and improve on their academic performance in mathematics through the use of learning related resources to their experiences. This means that learning resources. This means that learning resources should be at the level of understanding of the learners, considering age, gender, ability and individual differences. Teachers in the District will benefit from this study, as they are the immediate implementers of the curriculum. Therefore through this study they shall be in serviced through insets and seminars about learning resources. This may motivate them to use the locally available materials which in turn will make them improve their teaching approaches as well as improving the performance of the children in various subjects at school.

The policy makers will also benefit from the study, where they shall advise the Government accordingly on the system of education, they will also see the importance of

the curriculum review. They will also advise on the importance of using materials in children learning.

The Government through the Ministry of Education [MoE] will benefit by realizing the need of in servicing teachers on learning resources, so that the performance is improved. The (NGO'S) will also benefit from the study, they will see the importance of play materials for children learning, and therefore they can see how to go about with the schools they sponsor. Also when assisting needy schools they should focus on the learning resources and donate resources other than money. Other stakeholders can benefit are the parents and the community at large. When their children excel in academic work at school. Therefore they need to understand and be informed on the importance of learning materials for their children and be at the front line in helping teachers in making certain materials. They should be role models where they involve themselves especially in the collection of some resources which are readily available in the environment; also they should participate in the procurement of certain materials of the school. The study will also pave way for future researchers on the same. Last but not least it will lead the award of Bachelor Degree of Education to the researcher at the end of the assignment.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter shows the review of literatures related to this study. It presents the theoretical framework, how children learn mathematics, factors that affect children's learning of mathematics, the available learning resources in school and the effect of learning resources on pupils' academic performance in mathematics.

2.1 Theoretical Framework

J.E. Ormrod (2003) highlighted that learning is a relatively permanent change due to experiences. Therefore personal experience is very important in relation to what is to be learnt. Carl Rogers said, "I have come to feel that the only learning which significantly influences behavior is self discovery, self appropriated learning." Where Nathaniel Cantor said, "All genuine learning in the final analysis is self education." This study is based on the social cultural cognitive theory of Lev Vygotsky (1896 -1934) like Piaget Vygosty believed that children actively construct their knowledge. Vygotsky's (1978) social cultural theory, like Piaget's theory of cognitive development emphasizes children active engagement with their environment. In deed children enjoy playing with materials within their environment; as a result they develop certain skills. Vygotsky (1978, 1986, 1987, and 1993) suggested that cognitive development depends much more on interactions with the people in the child's world and the tools that the culture provides to support thinking. Vygotsky's view captured by (Tappan, 1998) says that, "the child's cognitive skills can be understood only when they are developmentally analyzed and

interpreted, that is children's knowledge, ideas, attitudes and value develop through interaction with others. Children learn not through solitary exploration of the world, but by appropriating or "taking for themselves" the way of acting and thinking provided by their culture (Kozulin & Presseisen 1995). Vygotsky said adults must help direct and organized a child's learning before the child can master effective in helping children cross zone of proximal development (ZPD) the gap between what they are already able to do and what they are not quite ready to accomplish by themselves. Children in the (ZPD) for a particular task can almost, but not quite perform the task on their own. With the right guidance, they can do it successfully. In the course of collaboration, responsibility for directing and monitoring learning gradually shifts to the child. Vygotsky's theory has stimulated considerable interest in the view that knowledge is situated and collaborative (Greeno, Collins & Resnick 1996; Rogoff 1998). That knowledge is distributed among people and environment which include objects, artifacts, tools, books and the communities in which people live. This suggests that knowing can best be advanced through interaction with others in cooperative activities. Vygotsky articulated unique and influential ideas about the relation between learning and development. Vygotsky's theory had its implication for teachers such as imitative learning, instructed learning, collaborative learning and assisted learning which are very important today for children learning.

2.2 How Children Learn Mathematics

Learning being a relative permanent change in behavior due to experiences. S Kumar.N.Ratnalikar (2003) outlined that pupils tend to learn mathematics through a meaningful approach to mathematics rather than mechanical process. Children have a

natural curiosity and delight to discover things for themselves. Due to this curiosity children usually like playing with materials, as they play they learn new skills. Jacinta and Regina (1992) highlighted that, "Children Learn best by doing." Children must be active and do things for themselves before they can master a subject. Children have low concentration span if they are just listening. They therefore concentrate a bit longer if they listen and watch but they can concentrate best when doing the thing themselves. In doing, the child will not only master but also acquire competence in the activity.

Therefore this implies that when more of their senses are used in acquiring knowledge, the deeper the impression that is made in the mind and there is high rate of retention of knowledge and skills learnt. As the saying goes, "Nothing is learned unless we are active in it." Children learn from other children, because children are closer to each other in the way they look at things. A.A. Said, B. Wallhager, R.m. Cungua and P. Ngie (1997) articulate that a child will not only learn from adults but also from his brothers, sisters and playmates. They should be encouraged to be resources to each other, seek and give help to each other and share many of their experiences. They also learn through trial and error and practice. A.A.Said, B. Wallhager, R.M. Cungua and P. Ngie (1997) said, a child learn by trial and error once he finds out the best way of doing something then opportunity should be provided so that he can practice several times and become expert at that activity. Children learn through imitation where they imitate their teacher teaching. A child would copy an adult or an older child he likes in a number of activities. He will try to act or talk like an adult does. Children are very active in nature such that they need sometimes to be left on their own to explore their environment. They will touch, shake,

test, bite or open anything comes in their way to find out what happens. If the experience is good they will repeat it, if not they will avoid it. Free exploration and discovery help the children find out how things work and behave and what happens to them. This way children learn more and remember what they have found out. Children's curiosity and desire to know things leads them to ask many questions. Even if they know the answer, children still ask the question. Therefore through asking questions, talking and listening helps children to learn. They also learn through play where they socialize, develop certain skills as they explore and discover for themselves. Play is a natural way which children learn and experience the world around them. Children always use their imagination when playing. B.L. Young (1994) noted that children are interested in themselves and their bodies. There are many things which they can learn about themselves, counting, measuring, classifying, experimenting and inferring are some of the processes which can be developed. Therefore children learn, through practicals. For their learning to be meaningful and sensible L.A. Hanna, G.L. Pother, N. Hagaman (1964) said opportunities must be provided for children to participate, experience, react and do.

2.3 Factors That Affect Children Learning of Mathematics

Learning being a natural outcome of the individual's attempts to meet his basic and normal needs. Julia Weber points out in a paper on child development that children want to learn, to know and to "be able." They do not have to be "teased" or "techniqued" into growing. Donald Snygg states, "the learner is not a passive victim of his environment."

Therefore there are a number of factors that affect children's learning of mathematics. They include environment, home background, the teacher, learners past experiences, learner's needs, learner's readiness, age of the learner, heredity, motivation and many more. Conducive environment for children learning will always motivate learners as they explore and discover their environment through touching, smelling, tasting. If the environment itself is not warm and inviting giving the child a sense of belonging, it will affect learning. The safety of the environment will affect the child. He should be told clearly what he may or may not do and know where he may not go. It is in the environment where they involve most of their senses hence high rate of retention of whatever is learned, because of variety of materials used.

A child's home background is one of the strongest influences on his ability to learn a number of reasons. One of the most important is the quality language experience. The richness of this experience affects not only the child's intellectual development but also his ability to communicate, ask questions and learn. Another reason is the quality of caring that is the diet, amount of rest and sleep will affect his physical development which in turn affects intellectual development. The attitude towards the child and the way his self image has developed also affects learning. Activities, which interest the child and therefore produce intrinsic motivation, are more likely to lead to learning. For this reason children should be allowed to choose the activity they would like to do. Therefore, pleasant associations with activity motivate children. Therefore the whole approach to a subject is important. Children are motivated if they are made to feel that the activity is worthwhile.

Thus the child will be motivated to do the activity again. A stimulating environment will motivate the children, if there is always something new and interesting to do, the children intrinsic motivation to learn will be apparent. The satisfactory completion of a task will motivate the child. Children learn and benefits from activities and experiences if they are happy. A warm, caring and happy atmosphere at home and in school is essential for successful learning. When children are interested to learn, they will always find things to learn. Therefore organized activities planned by adult should be made as interesting and as varied as possible to the level of the learner.

Children do not learn every thing at the same time. The level of growth and development determines the child's readiness for certain activities. Many a times, adults force children to know or learn things for which they are not ready. Such a situation frustrates the child and therefore unable to learn or he will develop resistance and hatred for such activity that lead to a sense of failure. This will be a big obstacle for further learning.

2.4 The Available Learning Resources in School

Learning resources refers to any person, material, thing or an event that establishes conditions which enables the learner to acquire knowledge, skills and attitudes. It is any means that a teacher may use to arrest, process, and reconstitute visual or verbal information for learners to comprehend more clearly. S Kumar and D.N.Ratnalikar (2003) highlighted that learning resources helps in clear understanding of the subject and clarifying the abstract ideas. They appeal to the senses of pupils and so they satisfy their innate tendencies and interests. There are various learning resources which can be used in

mathematics. Therefore the available learning resources in school ranges from improvised to commercial resources. They include real objects, charts, textbooks, workbooks, blackboards, radio and many more.

2.5 The Effect of Learning Resources on Pupils Academic Performance in Mathematics

In an article with the provocative title “Media will never influence learning.” (1994) Richard Clark rejoined the media effects debate that has raged in the field of educational technology for decades. Clark’s article was the corner stone of an issue of the journal

Educational Technology Research and Development (ETR&D) that attempted to clarify the discussion about media effect and learning. Clark reiterated along-held position that the research literature clearly demonstrate that media do not determine learning. On one side of the media effects issue are those such as Clark who advocated the following position. Educational media alone do not influence the achievement of students. Media permit the delivery and storage of instructional messages but do not determine learning. Clark related the media as “The best current evidence is that media are mere vehicles that deliver instructions that do not influence students achievement any more than the truck that delivers our groceries causes changes in nutrition... only the content of the vehicle can influence achievement (Clark 1983; P.445).” However (Petkovich, M. & Tennyson, R. 1984; Kulik, J.Kulik, C. & Bangert-Downs, R. 1985; Cunningham, D. !986) Robert kozman (1994) presented one of the most convincing argument when he stated that the field should move to a study of ways the capability of media can be used to

influence learning of particular students for certain tasks and in specific situations. The Secondary education mathematics handbook (K.I.E 2006) highlighted the use of learning resources in mathematics enhances the understanding and development of skills and concepts. The use of resources also makes learning more interesting as a result of which pupils develop positive attitude towards mathematics. Kumar & D.N. Ratnalikar (2003) outlined that learning resources are actually aids to imagination of children since most of the learning in children takes place at the sensory level, so the senses are the gate way of knowledge. Teaching aids influences the minds of the learners through their senses. The use of learning resources makes learning effective, simple and interesting. They also stimulate pupils' participation. They are based on the maxim, "learning by doing." Learning resources helps in the meeting of the needs of individual students.

CHAPTER THREE

RESEARCH METHOPDOLOGY

3.0 Introduction

This chapter shows the general methodology followed in this study. It shows the design followed in this study, the research environment, population and sample, research instruments and the method of data analysis and the review.

3.1 Research Design

The researcher employed an experimental research design, in carrying out the study. The researcher conducted practical teaching of the subject. After this the researcher administered a pre-test and recorded the marks in the record sheet. The researcher randomly divided learners into two major groups, that is control group and experimental group. The researcher then had to teach the two groups the same thing but this time he used no resources when teaching the control group, where in experimental group he provided learning resources and gave them task to carry out which was just the same as in the first group.

3.2 Research Environment

The study was carried out in Secondary school, Kuria East District. The area was chosen because was a geographical position at the same time it is researcher's work station therefore well versed with. The school is mixed and day. Pupils come from different background and diverse culture. It is one of the biggest schools in the District.

3.3 Population and Sample

The study populations consisted of boys and girls of Kuria East District. The target population is 54 pupils from the researcher's class. Where there are 30 girls and 24 boys. The researcher applied random sampling in coming up with the sample. Through random sampling the researcher was able to come up with two major groups that is control and experimental groups. The groups were mixed up that is boys and girls. The two major groups had 27 pupils each. The control group was without materials where they were expected to learn, while the experimental group was further divided into three small groups of nine members each, they were also expected to learn where they were provided with enough learning materials and task given focusing on the materials to be used.

3.4 Research Instrument

The researcher used tests as an instrument for collecting data on the effect of learning resources and pupils' academic performance in mathematics. The purpose of the test was that the pre-test was used as a vehicle to know what learners could remember and apply in solving problems to test their understanding. After recording the marks the researcher carried out practical teaching on the same subject after which he gave another test for both groups and recorded the marks then he compared the two tests for both groups considering gender to find out how girls and boys performed at the same time focusing on the control and experimental groups' performance. However the tests provided an avenue for corrections and revision which was not the aim of the study. Tests were techniques used to determine and obtain the qualitative and quantitative data which was

the main focus of the study, and the effect of learning resources on the pupils' academic performance.

3.5 Methods of Data Analysis

The data collected was sorted and categorized after which it was analyzed. Frequency tables were used to analyze the data. The students' samples t-test was used to compare mean scores for the two groups and recommendations were made. The same technique was used to test the null hypotheses involved in this study

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter shows data as collected from the field and analysis of these data also done. It also shows description of data, how children learn mathematics, factors that affect children's learning of mathematics, the available learning resources in schools and the impact of learning resources on pupils' academic performance in mathematics.

4.1 Data Description

This section shows the description of data according to gender, class group and method of teaching a group.

4.1.1 Description of Respondents According to Gender

The study was conducted among Secondary one pupil. There included boys and girls who were selected randomly. The study included 25 boy / male pupils and 29 female pupils, making a total of 54 pupils. Table 4.1 shows he description of respondents according to gender.

Table 1: 4.1: Description of pupils by Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	25	46.3	46.3	46.3
female	29	53.7	53.7	100.0
Total	54	100.0	100.0	

It is clearly indicated in table 4.1 that girls exceeded boys with 54% and 46% respectively. This shows that the study class was dominated by female pupils.

4.1.2 Description of Pupils by Class Group Attended

The class in this study was subdivided into two groups. There was a control group and an experimental group. The control group was that group that was taught without teaching / learning resources. The scores of this group were compared with those of the experimental group. It is called the control group because it controls the conclusion to be made. If the results of the control group exceed those of the experimental group we can conclude accordingly and vice versa.

The class was randomly divided into 27 pupils who participated in the control group and 27 pupils who participated in the experimental group, making a total of 54 pupils. Table 4.2 shows pupils class group attended.

Table 2: 4.2: Description of Pupils by Class Group Attended

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Control Group	27	50.0	50.0	50.0
Experimental Group	27	50.0	50.0	100.0
Total	54	100.0	100.0	

Table 4.3 shows that within the control group, 15 pupils were males and 12 were female. However, girls dominated the experimental group with 17 female pupils in the

experimental group and only 10 male pupils in the control group. This is indicated in table 4.3

Table 3: 4. : Students Gender * Class Group Attended Cross Tabulation

Count		Class Group Attended		Total
		Control Group	Experimental Group	
Students	Male	15	10	25
Gender	Female	12	17	29
Total		27	27	54

4.1.3 Description of Marks by pre-test post test Groups

In this case, there were two types of tests given by the researcher. The pretest and the post-test test. The pre-test refers to the test that was given before teaching with the required materials was done. This was intended to establish the general level of academic ability of these pupils. This test was given to the whole group of 54 pupils before they were divided into control and experimental groups. This helps make objective evaluation of the impact of the test factor (Teaching/ learning materials) in question. Table 4.4 shows pupils' marks by pre- test and post test groups.

Table 4: 4.4: Descriptive Statistics for Pupils' pre- test and post test Scores

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Test Scores	54	16	72	36.28	11.890
Post-test Scores	54	26	74	44.80	11.853
Valid N (listwise)	54				

According to table 4.4, the mean scores for the post-test group, exceed the mean scores for the pre- test group (45% and 36%) respectively. Also, the highest score for post test

group exceeded slightly that for the pre-test group (74% and 72% respectively). This shows that pupils in the two groups are almost at the same level of academic ability.

4.2 How Children Learn Mathematics

In trying to highlight on how children learn mathematics, the researcher used observation and interview techniques of data collection. The observation results were basically represented in the test results of pre- test post- test groups. The interviews were held mainly by teachers of mathematics and some few pupils who were selected randomly from class.

In this study 10 teachers of mathematics were interviewed and results are summarized in the fore group explanations. As indicated in table 4.5, teachers argue that pupils especially from lower classes learn best by doing, in what they called a “hands on learning”

Table 4.5: Teachers Views on How Children Learn Mathematics

Response	counts	Relative frequent
Pupils learn more by doing	8	80
Pupils like to discover	3	30
Learning should involve play	2	20
Pupils learn more when listening and seeing	7	70
Pupils learn more from interaction with peers	3	30
Pupils learn more by copying	5	50
Pupils learn more by experience	2	20

Table 4.5, shows that most pupils learn more when they are either doing some thing (80%) when teaching mathematics, teachers should improvise learning materials which can attract pupils’ minds to learn. Also mathematics lessons should be problem based,

where teachers should use problem solutions teaching. This is in agreement with said et al (1997), who showed that a child learns by trial and error, once finds out the best way of doing something, and then opportunity should be given that he/ she can practice. This implies that the teacher in class should do less talking and pupils should do less listening. Thus the teacher should always guide pupils as they are practicing/ solving several problems. Doing something or seeing it, awakens other senses and helps in proper learning, where as listening makes the mind dull especially if it is prolonged.

Pupils also learn more by copying. They may copy friends or teachers. Said et al conforms this, when he showed that children do not only learn from their fellows but also from adults, brothers, sisters and playmates. This means that if given activity or materials to use, pupils can learn from each other. They always seek and give guidance from each other. Pupils understand more their fellows and find it easier to consult their classmates than consult teachers. It is thus better that teachers encourage group work in class because pupils learn better from their friends.

Pupils also learn by experience. This means that pupils can learn from what they already know, that is why teaching should begin from the known to unknown. Pupils also learn by experiencing the environment. This involves the materials around them so if there are relevant materials pupils can learn from them. Also experiencing those who know or experimenting makes learners to learn more. That is why problem solving is more vital in teaching especially mathematics.

4.3 Factors That Affect Children's Learning Of Mathematics

There are a number of factors that affect pupils' learning in general. Pupils learning of mathematics 'is thus not so different from other subjects. Thus the factors that affect learning of a child in other subjects can also attack his/ her learning in mathematics.

In investigating about the factors that affect pupils' learning of mathematics, two data collection technique and the questionnaire. Teachers were involved in an interview, asking for their views about the factors that influence pupils' learning of mathematics. After gathering their views, the researcher, designed questionnaire, the questionnaire required the teachers to rate the factors discussed upon in the interview schedule. Results of this are summarized in table 4.6

Table 4.6: Factors That Affect Pupil Learning Of Mathematics

Factor	Very important(VI)	Important (I)	Less important(LI)	Not important(NI)
Pupils attitude	1 (10%)	8 (80%)	1 (10%)	0
Environment	2 (20%)	7 (70%)	1 (10%)	0
Past experience	1 (10%)	5 (50%)	4 (40%)	0
Home background	5 (50%)	4 (40%)	1 (10%)	0
Teacher factors	6 (60%)	3 (30%)	1 (10%)	0
Age of a learner	3 (30%)	3 (30%)	2 (20%)	2 (20%)
Motivation	4 (40%)	4 (40%)	2 (20%)	-
Learner's needs	0	2 (20%)	6 (60%)	2 (20%)
Learner's readiness	4 (40%)	5 (50%)	1 (10%)	-
Hereditiy	0	2 (20%)	4 (40%)	4 (40%)
			4 (40%)	

School factors	3 (30%)	3 (30%)		0
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Note: Each teacher responded to each factor. The responses add to 100 for each factor.

Table 4.5 indicates the general fact that a number of factors are responsible or affect pupils' learning of mathematics. However, the most important factors are pupils' attitude or desire to learn mathematics (90%), environmental factors (90%), Home background (90%), teacher factors (90%), motivation (80%) and readiness of learners (90%). These factors, according to teachers' views are either important or very important and there is No teacher showed that any of those factors is not important. This implies that all stakeholders in the education of the child should improve ability in learning mathematics. This also implies that proper learning and success of a learner is through collective effort and so no single factor is solely responsible.

4.1 The Impact of Learning Resources on Pupils' Performance in Mathematics

As pointed out by Kumar and Ratnalikar (2003), learning resources influence the minds of learners through their senses. Anything that affects the senses is very instrumental in life of some one. In investigating the impact of learning resources on pupils' performance in mathematics, an experiment was conducted. In conducting the experiment, the researcher divided the class into the control and the experimental group. The control group was taught a lesson without using the selected learning resources. The same lesson and content were taught to the experimental group, but this time using the selected resources. A similar test was given to the two groups and results were noted down. Previously, a pre-test was given before dividing the class, to test the general academic level of each learner.

Results of the control and the experimental group were compared before a conclusion was made. These results were also compared with the pre-test results and the conclusion was made.

In analyzing the data from the pre and the post test groups and from the experimental and control group, SPSS data processor was used to compute the t- statistic. The independent samples t-test was technique used. The independent samples t-test is a statistic usually used to compare two means. A researcher using the t-test is normally interested in testing whether the two means differ significantly.

In the study there were two means to compare. That is, the pre-test score and the post-test scores and the scores for the control and experimental groups.

In computing the t-test statistic, the researcher wanted to test the following null hypotheses.

- (i) The mean scores of the pre-test and post-test results do not significantly differ.
- (ii) The mean scores of the experimental and control groups do not significantly differ.

In testing the first null hypothesis, scores from the pre-test and post-test groups were compared using the t-test for equality of means. Table 4.6 shows the results of the t-test.

Table 4.6: pre-test and post-test scores compared Independent Samples Test

		Post-test Scores	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	1.222	
	Sig.	.274	
t-test for Equality of Means	t	-.812	-.812
	df	52	50.580
	Sig. (2-tailed)	.420	.420
	Mean Difference	-2.630	-2.630
	Std. Error Difference	3.237	3.237
	95% Confidence Interval of the Difference		
		Lower Upper	-9.124 3.865

Table 4.6 shows that the mean scores of the pre-test and post-test scores do not significantly differ. This is indicated by a non significant, t-value of 0.812, and a sig-value of 0.420. This shows that the general academic ability of students in class of study was relatively consistent. This therefore means the null hypothesis above is accepted, implying that the alternative hypothesis is rejected. We there fore conclude that the mean scores of the pre-test and post-test groups do not significantly differ.

In testing the second null hypothesis, the same procedures were followed as in the first null hypothesis. Table 4.7 shows the results of this test.

Table 4.7: Control and Experimental Group Scores: Independent Samples Test

		Post-test Scores	
		Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F	1.171	
	Sig.	.284	
t-test for Equality of Means	t	-.802	-.802
	df	52	50.612
	Sig. (2-tailed)	.426	.426
	Mean Difference	-2.593	-2.593
	Std. Error Difference	3.233	3.233
	95% Confidence Interval of the Difference		
	Lower	-9.080	-9.084
	Upper	3.894	3.899

It is clearly indicated in table 4.7 that the performance of the two groups (experimental and control) does not significantly differ. This is indicated by an insignificant t-value of 0.802, with a p-value of 0.284. This implies that learning resources have no significant impact on students' performance in mathematics. Hence the null hypothesis is accepted and the alternative hypothesis is rejected. We therefore conclude that learning resources have no significant impact on academic performance of students in mathematics for its particular study.

The results of this study are not impressive as they are in agreement with Clark (1994) who reiterated that media do not determine learning. So if teaching media do not determine learning then they do not determine performance. However, Kozman et al (1994) talked of the capability of the media used. This therefore poses a challenge to conduct studies using various media.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter shows a summary of major findings, it shows the conclusion on each finding and then the recommendation to practitioners. The areas for future researchers are also highlighted.

5.1 Summary of Major Findings

This study was experimental in nature and included 25 and 29 male and female pupils respectively. The study tested impact of learning resources on pupils' performance in mathematics using both the control and experimental groups. The class was divided into 27 pupils of the control and an equal number of the experimental group. The major findings of this study are summarized below;

After giving a pre-experimental test (called pre-test). It was found out that the mean score for the post-test group (45%) exceeded the mean score for the pre-test group (36%). However the highest scores for the two groups did not greatly differ (74% and 72% respectively)

It was also discovered in this study that students learn more when they are doing, that is when they use a learning aid. The biggest number of teachers (80%) viewed that pupils learn more by doing, while 70% showed that pupils learn more when they are listening and seeing.

It was also discovered that although there are numerous factors that influence pupils' learning of mathematics, some are more important than others. The most important factors according to teachers' views are pupils' attitude (90%), environment (90%), teacher factors (90%), home factors (90%), learners readiness (90%), motivation (80%) and so on (refer to table 4.6- VI + I).

The study also found that learning resources have no significant effect on pupils' performance in mathematics. There was an insignificant p-value of 0.420, when testing the pre-test and post-test scores and an insignificant p-value of 0.284, when comparing scores of the experimental and control groups, in the post-test scores.

5.2 Conclusion

Basing on the findings of this study, it is concluded that, where the experimental and control groups are relatively consistent in their pre-test and post-test scores and that there is efficient randomization in assigning the two groups, learning resources will not show a significant impact on pupils performance in mathematic, as was the case in this study.

It is also implied in this study that teachers and pupils prefer to teach and learn with resources, touching item or seeing them make the lesson interesting, although may not significantly boost performance, as for this particular study.

It is further concluded that a positive attitude of pupils boosts their performance in mathematics. A good environment or academically friendly environment boosts pupils' performance in mathematics. Also a good teacher, experienced with proper handling of

pupils is likely to improve performance in mathematics. Pupils from families with ‘a good education environment, for example with educated parents or relatives, with time to revise and so on, are likely to perform well in mathematics likewise the learners’ readiness to learn (willingness) and a well motivated teacher and learner, make learning more interesting and improve performance especially in mathematics.

It is finally concluded that learning resources alone may not significantly affect performance of pupils in mathematics. Other factors as well as need to be available/ favourable for learning resources to have a significant impact.

5.3 Recommendations

Basing on the above findings and conclusion of this study, the researcher recommends that learning resources should be provided to pupils by either parents or education officials (like school administrators and ministry of education), but their validity should be tested. They have to ensure that these aids are suitable for a particular topic or content. So aids should not only be interesting but should also be relevant and applicable.

Teachers, Parents and other education stakeholders should ensure a positive attitude towards mathematics. This can be done through employing teachers who are efficient and trained for positive attitude creation.

Mathematics should be taught in morning hours and where possible a quiet environment is essential for proper learning. At home, parents should provide assistance and guidance

o pupils for example, p-providing an hour for revision, when all noise is put off, like TVs, radios e.t.c.

Also, learning should be made interesting by teachers and others, so as to boost learner's readiness and willingness to learn. Teachers and pupils should be motivated properly, for example through good rewards to good performers and problem solving techniques in class, which make pupils more participative in class and hence they will develop interest and will in learning mathematics.

Finally learning resources should be tested for validity, relevance and suitability for a particular topic, content and lesson. Again learning resources alone can not boost performance.

There is a need pupils' learning of mathematics, especially those that affect their attitude and psychological tendencies.

5.4 Areas for Further Research

Further studies should be conducted in the following areas.

1. Suitability of learning resources to particular content and topic and how this impact on performance can.
2. A study can be conducted testing many factors affecting pupils' learning of mathematics and to reveal which factor (s) is more vital.
3. A similar study may be conducted using a more suitable learning aid than the one used in this study.

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APPENDICES

Appendix A: Pre-test Test and Post-test

1. $25 + 25 =$
2. $15 + 16 =$
3. $3 + _ = 8$
4. $4 + 24 =$
5. $30 + _ = 38$
6. $19 + 7 =$
7. $13 + _ = 21$
8. There are 31 frogs in the pond 3 hops in how many now?
9. There are 53 ladybirds on a tree, if 12 hide how many are left?
10. There are 55 pupils in the pool, 12 get out. How many are left?

POST TEST

1. $24 + _ = 29$
2. 70 bees 18 fly away. How many are left?
3. 79 ants, 16 hide. How many are left?
4. 60 butterflies, 14 fly away. How many are left?
5. $13 - 7 =$
6. $28 - 6 =$
7. $40 - 7 =$
8. $28 - 18 =$
9. Subtract 3 from 79
10. Take away 9 from 80